

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
Northern District

RECREATION USE SURVEY OF
BIG GRIZZLY CREEK, PLUMAS COUNTY
2004

Technical Information Report No. 04-1

Prepared under the direction of

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by

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This report was prepared to summarize information collected under the Recreation Planning and Implementation Program to document recreation and fishery enhancement provided by a revised operation of Lake Davis. This report has received only limited review; it is intended for internal use and should be considered preliminary and subject to revision.

November 2004

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SUMMARY

An abbreviated survey of streamside recreation along Big Grizzly Creek, Plumas County, was conducted in 2004. The purpose of the survey was to estimate the amounts and types of recreation use and angler success occurring along the creek with augmented flow downstream from Lake Davis and Grizzly Valley Dam. Another important purpose of conducting the survey was to document downstream impacts and restoration of the trout fishery following the Department of Fish and Game's 1997 Lake Davis Northern Pike Eradication Project. The stratified random sample survey combined roving use counts with interviews of recreationists in order to gather information on recreation activities, visitor origin, and angler success.

There were an estimated 1,400 hours of recreation use on Big Grizzly Creek between April 24 and July 5, 2004. The most frequently observed activity was fishing. Just relaxing, walking for pleasure, swimming/wading/beach use, and sightseeing were also common activities. About 17 percent of all visitors came from Nevada and 63 percent lived in the northeast counties of California, mostly Plumas County. A large proportion of anglers and visitors lived in the City of Portola. Anglers kept an estimated 50 rainbow trout in 400 hours of fishing. Anglers also reported they caught and released a much larger number of rainbow and brown trout.

The survey was terminated after July 5 due to restrictions on State employee travel, reductions in the State budget, and other problems.

INTRODUCTION

Big Grizzly Creek below Grizzly Valley Dam offered an opportunity to implement the Department of Water Resources' water management policy, adopted in 1975, which states, "Instream uses for recreation, fish, wildlife, and related purposes shall be balanced with other uses." When Grizzly Valley Dam began operation in 1966, streamflows in Big Grizzly Creek below the dam were increased and stabilized. Minimum flows were increased from about 0.5 cubic feet per second to 8 cfs. Fishing and related streamside recreation were enhanced. An instream flow needs assessment later indicated that increasing flows to 20 cfs would further increase trout habitat over the post-project levels to near optimum levels without significant detriment to lake recreation (Haines 1982).

On a trial basis, Grizzly Valley Dam began a revised operation in June 1982. The Department of Fish and Game and DWR agreed to further revise operating criteria and releases in a 1994 agreement which was first implemented in 1998. Monitoring downstream recreation use, fish populations, and trout catch documents changes to these resources influenced by the modified flow release schedules. The agreement further obligated DWR to monitor impacts to reservoir water levels, if any, of this revised operation over the next several years.

The spring of 2004 was dry and runoff to Lake Davis was much less than anticipated. Maximum storage was reached April 1 at 52,968 AF (Elevation 5766.21) and gradually declined the rest of the year. Because the Lake did not fill the flow release was held at the prescribed minimum 10 cfs throughout the trout season (except for three days in October when flows were reduced to 5 cfs to permit DFG to monitor the fish population).

This report describes the recreation use survey, creel census, and results for the first half of the 2004 trout season, April 24 to July 5. A separate report, prepared by the Department of Fish and Game, Contract Services Section, describes a fish population survey conducted in October 2004 (Brown 2005).

Description of Study Area

Big Grizzly Creek is a major tributary of the Middle Fork Feather River (a designated National Wild and Scenic River) within the Plumas National Forest. The lower 6.25 miles of the creek flows from Grizzly Valley Dam and Lake Davis. From an elevation of 5,670 feet at the dam, the creek drops through steep-walled canyons, flows through the eastern edge of Smith Peak State Game Refuge, crosses under Highway 70 about 2 miles east of the City of Portola, and joins the Middle Fork Feather River on the western side of Sierra Valley at an elevation of 4,870 feet (Figure 1).

Grizzly Road, which provides access from Highway 70 to Lake Davis, roughly parallels the creek. About 3.8 miles upstream from the mouth a dirt road, called Burnham Ranch Road, provides public access to some of the more rugged areas of the creek. This road may be improved in the next few years; private lots are being developed adjacent to the public access area described below. The mouth of Big Grizzly Creek downstream from Highway 70 can be accessed from the Rocky Point Road.

Among other things, Big Grizzly Creek provides visitors with opportunities for trout fishing (predominantly rainbow trout until recently), walking and hiking, flora and fauna study, relief from summer heat in the form of swimming and wading, and enjoyment of fall colors.

In 1984, DWR used Land and Water Conservation Funds to purchase a strip of land along Big Grizzly Creek to provide public fishing access. This created a public access area below the dam nearly three miles long, although portions of the surrounding area are privately owned and typically posted against trespass. Overall, about 4.25 miles of the 6.25-mile reach of Big Grizzly Creek below Grizzly Valley Dam have been traditionally used by anglers and other recreationists. The remaining two miles of the creek were generally inaccessible and/or clearly posted against trespass.

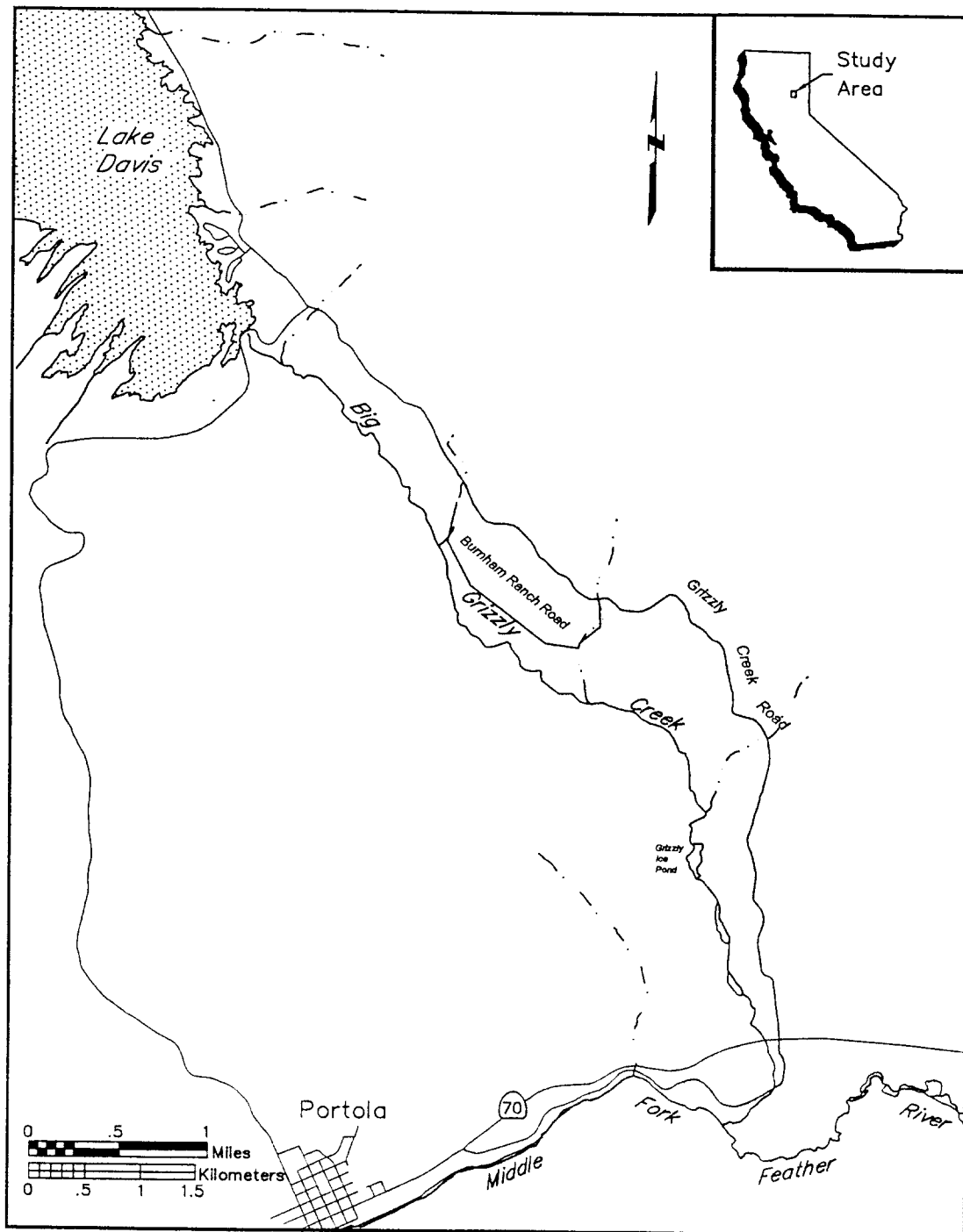


Figure 1. Big Grizzly Creek, Plumas County, 2004

For example, public access is prohibited at Walton's Grizzly Lodge, a camp for children at the Grizzly Ice Pond. The camp uses the pond for fishing and swimming and the surrounding area for other camp activities. Lodge visitor use was not measured and is not included in our estimates.

The Burnham Ranch Road parallels nearly 2 miles of the DWR-owned property, and has been generally open to public access until 2004. However, as properties along the road have been developed, complaints have increased from local landowners about public use of the Burnham Ranch Road to access Big Grizzly Creek.

This led to a review of the property grant deeds and agreements by DWR's Division of Land and Right-of-Way in 2004. The review found that, in fact, the general public does not have a right to use Burnham Ranch Road to access the publicly-owned property along Big Grizzly Creek. The only legal public access is to hike downstream along the property from the U.S. Forest Service land below Grizzly Valley Dam.

The general area has a rich history of gold mining, farming and ranching, lumber production, and railroading. In recent decades, recreation use in Plumas County has increased greatly, with water-related uses a major attraction. Employment today is divided among services, government, timber harvesting, ranching, and farming.

Grizzly Valley Dam was built as part of the State Water Project in 1966. Originally planned to supplement irrigation in Sierra Valley, it was completed mainly to provide reservoir recreation, improve the fishery downstream in Big Grizzly Creek, and provide domestic water to the City of Portola. Releases for recreation, fish, and wildlife are based on the May 1 water surface elevation of Lake Davis. In addition to the releases for downstream fisheries and water rights, the reservoir is usually operated to prevent spill. This requires large releases of up to 250 cfs in the early spring of some years (DWR 1974), and as a result spill has been negligible since 1986.

In October 1997 the Department of Fish and Game chemically treated Lake Davis to eradicate non-native northern pike. This action and the resultant closure of the lake until July 1998 had both direct and indirect impacts on recreation and fishing use on Big Grizzly Creek. An important purpose of conducting a Big Grizzly Creek recreation use survey in 2004 was to document any lingering effects the project had on recreation use in this area. Escape of rotenone from Lake Davis killed virtually all trout in Big Grizzly Creek downstream to the Grizzly Ice Pond. DFG restocked the creek in 1998 and 1999 with fingerling and "sport-sized" rainbow and brown trout plus a few broodstock rainbows and browns in 1999 (Table 1).

Table 1

Trout Planted in Big Grizzly Creek following Chemical Treatment of Lake Davis

	Species	Approximate Number of Fish	Approximate Size	Pounds of Fish
1998	Rainbow Trout Sport-sized	200	2 / pound	100
	Rainbow Trout Indian Creek	30	6-12 inches	Unknown
	Rainbow Trout Eagle Lake Strain	800	2 / pound	400
	Rainbow Trout Eagle Lake Strain	2,000	Fingerling	Unknown
	Brown Trout Sport-sized	450	1.8 / pound	250
	Brown Trout Fingerlings	11,250	Fingerling	Unknown
	Brown Trout Indian Creek	20	6-12 inches	Unknown
	Brown Trout Fingerlings	11,250	Fingerling	Unknown
	Brown Trout Brood-stock	40	6 pounds	240
1999	Rainbow Trout Sport-sized	500	1.5 / pound	333
	Rainbow Trout Fingerlings	5,500	610 / pound	9
	Rainbow Trout Brood-stock	7	6 pounds	42
	Brown Trout Sport-sized	1,000	1.8 / pound	556
	Brown Trout Fingerlings	1,000	250 / pound	4
	Brown Trout Brood-stock	40	6 pounds	240

METHODS

Recreation Use Counts

Use counts were made on randomly selected dates within five survey strata using the optimum allocation method described by Abramson and Tolladay (1959). Seventeen days of the 74-day period from April 24 through July 5, 2004, were surveyed: both days of the opening weekend of trout season, 3 of 6 holiday weekend-days, 8 of 47 weekdays, and 4 of 16 weekend-days. Five one-hour counts of recreation use were made in the study area each survey day at regular periods, scheduled according to the number of daylight hours (Appendices I and II). On four surveys the 3rd, 4th, and 5th use counts actually were made during the afternoon, and the 1st and 2nd counts the following morning as noted in Appendix I. This was done on a trial basis in an attempt to reduce overtime work and reduce project costs.

The surveys were made from vehicle or on foot, as necessary, to check access and recreation sites. Recreationists were counted and recorded by recreation activity. The five daily counts were totaled and multiplied by factors that accounted for recreation use in the daylight periods not counted. Similarly, the resulting daily figures were expanded to estimate total recreation hours for all days in each stratum. Adding the stratum totals provided an estimate of recreation hours for the study period.

Creel Census

Anglers along Big Grizzly Creek were contacted on 11 of the 17 survey days to determine fishing success (on 6 dates no anglers were found to interview). The county of residence and length of time spent fishing so far that day were recorded for each angler contacted. Fish censused were counted, measured (fork length to nearest 0.5 cm), and identified to species. To determine total catch, the catch per hour was multiplied by estimated hours of fishing for each stratum and the totals for each stratum were summed.

RESULTS

Recreation Use

Total recreation use on Big Grizzly Creek was estimated at 1,400 recreation hours (\pm 400 hours) for the period April 24 to July 5, 2004. Counts of people along Big Grizzly Creek indicated that, overall, fishing was the major activity, followed by just relaxing, walking for pleasure, swimming and wading, sightseeing, bicycle riding, and miscellaneous uses (Table 2).

Table 2

Recreation Hours by Activity, Big Grizzly Creek,
April 24–July 5, 2004

Activity	Recreation Hours	Percent
Fishing	350	25
Just Relaxing	300	21
Walking for Pleasure	150	11
Swimming and Wading	150	11
Sightseeing	150	11
Bicycle Riding	100	7
Miscellaneous/other*	200	14
Total	1,400	100

* Includes motorcycling (80 hours), walking dog (30 hours), children playing (10 hours), and undefined other activities (80 hours).

Fifty-eight interviews were conducted on the 16 survey dates, representing 126 people. The interviews revealed what people said they did during their visit. About 60 percent of the visitors to Big Grizzly Creek said they were just relaxing, followed by swimming, wading, and beach use (29 percent), fishing (29 percent), sightseeing (7 percent), and miscellaneous other activities (12 percent).

These percentages add up to more than 100 percent because many people took part in more than one activity during their visit.

About 88 percent of the interviewed visitors were day users (i.e., returned home at night), and 12 percent stayed overnight somewhere in the area (usually at one of the homes or cabins along the creek). Camping appears to be an infrequent activity, and no one was observed camping on the DWR property this year.

Visitor origin (Figure 2) was predominantly from Northeast Counties, generally Plumas County (63 percent). Visitors from Nevada, primarily Reno/Sparks, totaled 17 percent of all users. Bay Area visitors made up 13 percent, while 5 percent came from Mountain Counties, and 2 percent from the Sacramento Valley.

Creel Census Data and Angler Success

During the April 24 to July 5 survey period, 31 anglers were contacted. They had fished 51.5 hours, with an observed catch of 6 rainbow trout (*Oncorhynchus mykiss*). In addition, 102 trout were reported to have been caught and released.

Total angling use was estimated at 350 hours (\pm 200 hours), or roughly 125 angler-days, with an estimated catch of 50 rainbow trout (0.14 trout per hour). The mean length of 5 rainbow trout measured during the 2004 survey was 34.9 cm (13.7 in) with a range of 32.5 to 43.0 cm (12.8 to 16.9 in). About 39 percent of the anglers fished with lures, about 23 percent with bait, 23 percent with flies, and 16 percent used both bait and lures during their time fishing.

Based on trout reported caught and released, an additional 1,200 trout may have been caught and released, but this large number is suspect because it resulted from several anglers who reported very large catches.

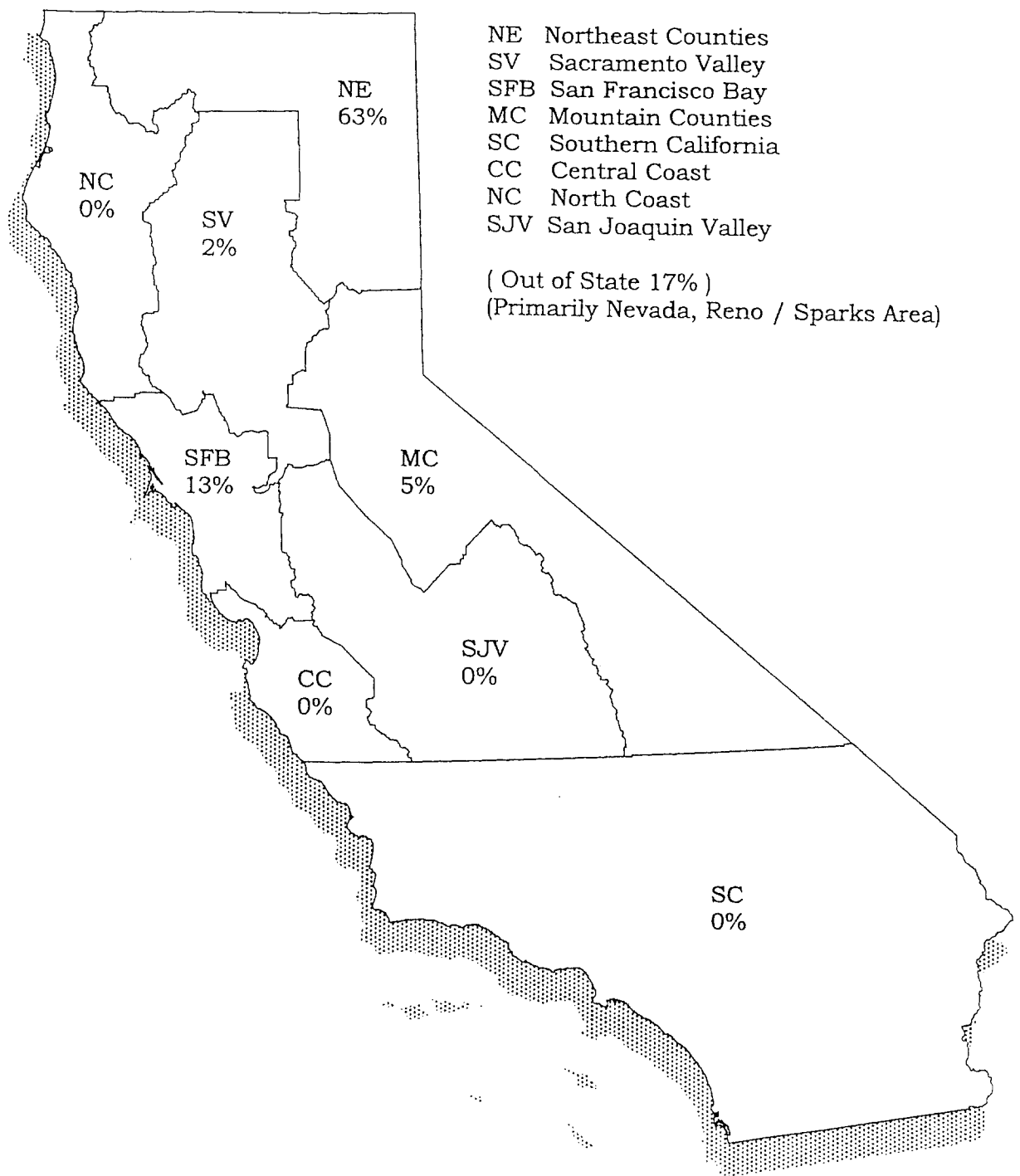


Figure 2 - Big Grizzly Creek Visitor Origin by County Groups 2004

Big Grizzly Creek angler origin (Figure 3) was predominantly from the Northeast Counties (42 percent). Anglers from Nevada, mostly Reno and Sparks, totaled 26 percent. Twenty-three percent of anglers came from the San Francisco Bay Area, 6 percent came from the Mountain Counties, and 3 percent from Southern California.

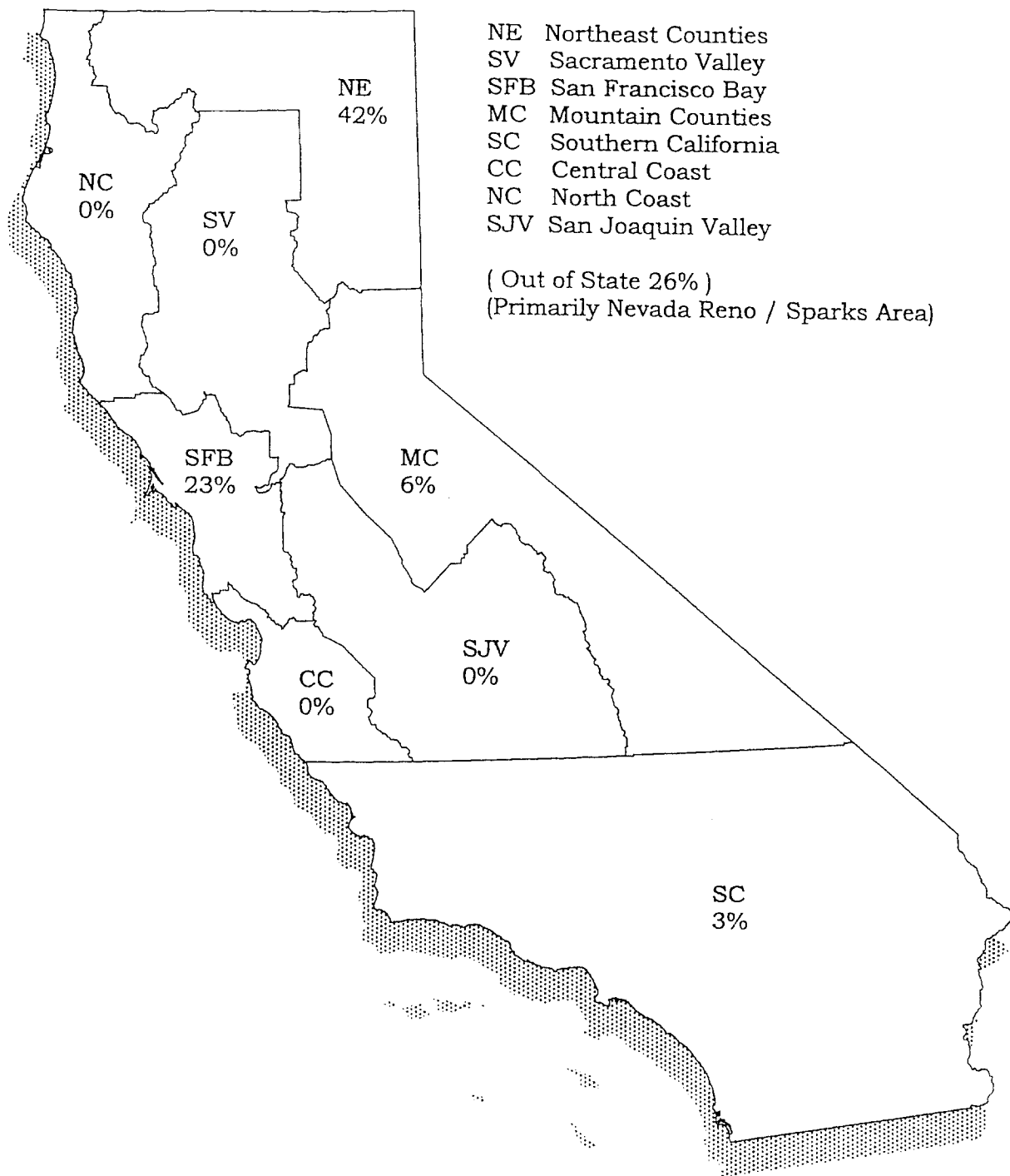


Figure 3 - Big Grizzly Creek Angler Origin by County Groups 2004

DISCUSSION

Counts and Creel Census

Most people using the creek were readily observed during the use counts. Vehicle access points were checked on each count, and people were found for most vehicles. Vehicles of U.S. Forest Service, DWR workers, Game Wardens and other non-recreationists sometimes park along the road, normally making vehicle counts a poor index of recreation use. About fifteen percent of the estimated fishing use was represented in the creel census.

Comparison with Use in Previous Years

The recreation survey of Big Grizzly Creek was abruptly and prematurely terminated after July 5, 2004 due to a number of circumstances. The State Budget had not passed and employee travel was severely restricted. The status and conditions of Student Assistant employment changed and they were no longer allowed to travel unaccompanied. When the budget was eventually approved and travel restrictions lifted, Student Assistants still could not travel, and the cost of conducting the survey with permanent staff would have exceeded the funds budgeted.

So, the abbreviated survey in 2004 cannot be directly compared with surveys conducted in previous years. However, a rough estimate of use and catch in 2004 can be obtained by comparing the 2004 estimates with use and catch during the same period (Opening Weekend of trout season through July 5) in the previous surveys. This expansion assumes that public use of the creek along Burnham Ranch Road was not restricted more during the last half of the 2004 season than during the first half of the season. The validity of this assumption is unknown.

Examination of data collected in previous surveys conducted on Big Grizzly Creek in 1986, 1991, 1994, 1997, 1998, and 2001 (Tittel 1987; J. Brown 1992; Scott 1995; Elkins 1999a; Elkins 1999b; Nicholas 2002) indicates that approximately 47 percent of the total recreation use and 59 percent of the fishing use and catch of trout typically occurs by July 5th. This suggests total recreation use of roughly 3,000 hours of recreation use in 2004 with angling use of about 600 hours and catch of 100 trout.

In general, these data continue a decline in total recreation use on Big Grizzly Creek since a peak in 1994. The 2004 recreation survey reflected lower use than any previous survey. Patterns of recreation use and fishing may have also changed due to the increased number of people living along Burnham Ranch Road. The relatively low use in 1998 was most likely attributable to DFG's Pike Eradication Project and the closure of the Lake Davis Recreation Area. After a rebound in 2001, the even lower use in 2004 likely reflects increased effort by local landowners to restrict public access on Burnham Ranch Road. Table 3 summarizes differences observed over the years.

During the 2004 trout season, anglers fished an estimated 600 hours, with an estimated catch of 100 rainbow trout. Thus, the fishing use in 2004 was similar to that in 1991, 1998, and 2001, but considerably less than in 1986, 1994 and 1997. The observed catch was the lowest observed in the seven years surveyed (Table 4). Angler success (trout per angler-hour) has generally declined in recent years, although success in 2001 was slightly higher than in 1997 and 1998. Despite the large numbers of brown trout planted in Big Grizzly Creek in 1998 and 1999, they did not contribute much to the fishery in 2001 or 2004.

The reasons for the decline in recreation use, including fishing and catch, are not clear, but they are likely to include increasing restrictions on public access to the creek, particularly along Burnham Ranch Road. Also, the increased numbers of brown trout may have some effect, because brown trout are typically more difficult to catch. In order to guarantee fishing access to the State property along Big Grizzly Creek the

State should purchase public access rights to the Burnham Ranch Road, and/or Plumas County needs to adopt the road as a public thoroughfare.

Table 3
Estimated Recreation Hours by Activity, Big Grizzly Creek

Activity	Year						
	1986	1991	1994	1997	1998	2001	2004
Fishing	2,900	800	2,200	1,400	800	900	600
Swim/Wade/Beach	800	1,000	600	100	100	800	400
Just Relaxing	200	200	1,000	400	500	1,100	700
Sightseeing	100	200	2,300	500	300	900	400
Walking for Pleasure		400	1,000	1,000	900	500	400
Miscellaneous/Other**	400	1,100	2,000	1,600	1,500	700	500
Totals	4,400	3,700	9,100	5,000	4,100	4,900	3,000

* Negligible, included in miscellaneous for that year.

** Includes: picnicking, camping, bicycling, children playing, OHV-use and various minor activities.

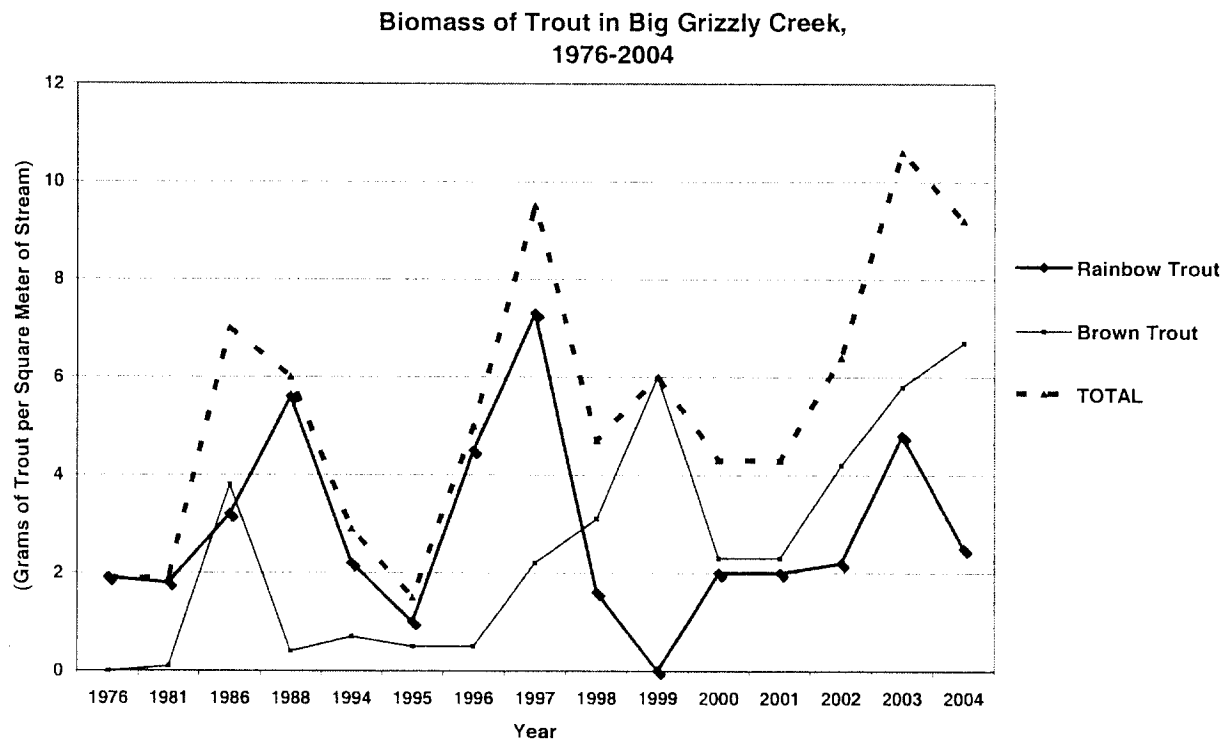
Table 4
Comparison of General Recreation, Fishing Use, and Angling Quality on Big Grizzly Creek

Activity	Year						
	1986	1991	1994	1997	1998	2001	2004
Recreation Use (Hours)	4,400	3,700	9,100	5,000	4,100	4,900	3,000
Fishing Use (Hours)	2,900	800	2,200	1,400	800	900	600
Rainbow Trout Caught (Estimated)	2,300	2,000	900	200	100	170	100
Brown Trout Caught (Estimated)	50	0.62	30	10±	<10	20	0
Angling Quality (trout caught per hour)*	0.81		0.42	0.16	0.13	0.21	0.17
Estimated Catch and Release	2,300	600	2,300	500	300	2,000	2,000

* Does not include catch-and-release.

Trout populations in lower Big Grizzly Creek have remained high over the years following construction of Grizzly Valley Dam and Lake Davis. Fish population surveys by the Department of Fish and Game since 1976 show, if anything, the trout population has increased. Since 1997 brown trout populations seem to have increased even though they don't contribute much to the fishery (Figure 4 and Table 4). Traditionally, Big Grizzly Creek has supported primarily a rainbow trout fishery, except in its lower reaches. That may have changed after 1997.

Figure 4



Source : Brown, Charles J. 2005.
 "Standing Stocks of Fishes in Sections of Big Grizzly Creek, Plumas
 County, 2004." California Department of Fish and Game, Central
 Valley Bay-Delta Branch.

Northern pike were first discovered in Lake Davis in 1994. Following this discovery the Department of Fish and Game began planning for the eradication of this non-native species. Implementing the plan to chemically treat the lake required several actions that affected Big Grizzly Creek below the dam. The action that had the most

direct impact on the creek was the unexpected fish kill in the creek when un-neutralized rotenone escaped through the valve at the dam during the treatment in October 1997. Virtually all trout in Big Grizzly Creek from the dam downstream to the Grizzly Ice Pond were killed by the rotenone.

Lake Davis and surrounding recreation facilities were closed to all public use from October 14, 1997 to July 10, 1998. Big Grizzly Creek is not located within the closure area, but the closure likely had a large impact on recreation and fishing on the creek, even though it legally opened to fishing on April 25, 1998.

The most popular fishing area on the creek, near the confluence with the Feather River, was not affected by the chemical escape, but public perception of chemicals in the stream probably kept some anglers from fishing the creek during the Lake Davis closure. Both rainbow and brown trout, of various sizes including some very large brood stock, were planted in Big Grizzly Creek in 1998 and 1999 in an effort to restore the fishery (Table 1). This apparently caused a shift in the trout population structure and brown trout seem to have become the predominant species.

ACKNOWLEDGMENTS

The use counts, creel censuses, and interviews were conducted by the author, with thanks to Environmental Scientist Margie Graham for her help on the opening weekend and to Retired Annuitant Ralph Hinton for filling-in occasionally during surveys. Thanks also to Mike Serna for preparing the graphs, Lori Miles who typed the text and tables, and a special thanks to Ralph Hinton for his suggestions and help during preparation of this manuscript.

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APPENDIX I

SCHEDULE FOR BIG GRIZZLY CREEK RECREATION SURVEY APRIL 24, 2004 TO JULY 5, 2004

Date	Holiday = HD Weekend = WE Weekday = WD	Survey Stratum
April 24	WE	I
April 25	WE	I
May 3-4*	WD	IV
May 11-12*	WD	IV
May 15-16*	WE	III
May 19	WD	IV
May 20	WD	IV
May 26-27*	WD	IV
May 29	HD	II
May 30	HD	II
June 4	WD	IV
June 14	WD	IV
June 19	WE	III
June 20	WE	III
June 23	WD	IV
June 27	WE	III
July 4	HD	IX

* Note: On these survey dates we conducted the 3rd, 4th, and 5th use counts during the afternoon of the first date and the 1st and 2nd counts on the following morning.

APPENDIX II

USE COUNT SCHEDULE FOR BIG GRIZZLY CREEK – 2004

Date	Daylight Hours	<u>Use Count</u>		Creel Census Time (approx.)
		Count	Time	
April PDT	15-1/2	1 st	0700-0800	0800-1200
		2 nd	1000-1100	1500-1900
		3 rd	1300-1400	
		4 th	1530-1630	
		5 th	1830-1930	
May-July PDT	16-1/2	1 st	0700-0800	0800-1300
		2 nd	1000-1100	1400-1900
		3 rd	1300-1400	
		4 th	1600-1700	
		5 th	1900-2000	